

WHAT IS CLAIMED IS:

1     1. In a snow plow having a snow plow frame for  
2     installation at the front of a vehicle, a shock-  
3     absorbing structure for cushioning the impact between  
4     a snow plow blade and a snow plow frame which supports  
5     the snow plow blade therefrom at a limit of movement  
6     of said snow plow blade, said shock-absorbing  
7     structure comprising:

8         a blade support frame member having right and  
9     left ends, said blade support frame member being  
10    supported by the snow plow frame which is mounted at  
11    the front of the vehicle;

12        said blade support frame member including blade  
13    mounting members which are fixedly mounted adjacent  
14    said right and left ends of said blade support frame  
15    member, respectively, said blade mounting members each  
16    defining a pivot point;

17        a snow plow blade having a frame comprising  
18    vertically oriented mounting ribs, each of said  
19    mounting ribs defining a pivot point;

20        connecting members used to pivotally connect  
21    corresponding ones of said mounting ribs to said blade  
22    mounting members, said snow plow blade being pivotable  
23    between a blade return position and a blade tripped  
24    position;

25        blade biasing members which urge said snow plow  
26    blade from said blade tripped position to said blade  
27    return position; and

28        a plurality of cushion stops mounted on one of  
29    said blade support frame member and said snow plow  
30    blade, said cushion stops being contacted by the other  
31    of said blade support frame member and said snow plow  
32    blade as said snow plow blade pivots prior to reaching  
33    at least one of said blade tripped position and said  
34    blade return position, said cushion stops thus  
35    absorbing a substantial portion of the impact force

36 which would otherwise be transferred to said blade  
37 support frame member.

1 2. A blade mounting structure as defined in Claim 1,  
2 wherein said blade support frame member is pivotally  
3 mounted from said snow plow frame.

1 3. A blade mounting structure as defined in Claim 1,  
2 wherein said frame of said snow plow blade comprises:  
3 a top plow frame member;  
4 a bottom plow frame member; and  
5 a plurality of ribs extending between said top  
6 and bottom plow frame members, said mounting ribs  
7 being two of said plurality of ribs.

1 4. A blade mounting structure as defined in Claim 3,  
2 wherein said top and bottom plow frame members and  
3 said plurality of ribs are all made of steel and are  
4 welded together to form said frame of said snow plow  
5 blade.

1 5. A blade mounting structure as defined in Claim 1,  
2 wherein said pivot point in each of said mounting ribs  
3 is defined by an aperture extending through each of  
4 said mounting ribs.

1 6. A blade mounting structure as defined in Claim 5,  
2 wherein said right and left blade mounting members  
3 each comprise:  
4 a first blade pivot mount which is mounted on  
5 said blade support frame member near an end thereof,  
6 said first blade pivot mount extending forwardly from  
7 said blade support frame member; and  
8 an aperture extending through said first blade  
9 pivot mount in the portion thereof which extends  
10 forwardly from said blade support frame member;

11 wherein said aperture in said right mounting rib is  
12 connected to said aperture in said first blade pivot  
13 mount which is mounted on said right end of said blade  
14 support frame member with one of said connecting  
15 members, and wherein said aperture in said left  
16 mounting rib is connected to said aperture in said  
17 first blade pivot mount which is mounted on said left  
18 end of said blade support frame member with another of  
19 said connecting members.

1 7. A blade mounting structure as defined in Claim 6,  
2 wherein said right and left blade mounting members  
3 each additionally comprise:

4 a second blade pivot mount which is mounted on  
5 said blade support frame member at a location which is  
6 adjacent said first blade pivot mount but is spaced  
7 away from said first blade pivot mount sufficiently  
8 far to admit one of said mounting ribs therebetween,  
9 said second blade pivot mount extending forwardly from  
10 said blade support frame member; and

11 an aperture extending through said second blade  
12 pivot mount in the portion thereof which extends  
13 forwardly from said blade support frame member, said  
14 apertures in said first and second blade pivot mount  
15 members being aligned;

16 wherein said one of said connecting members extends  
17 sequentially through said aperture in said first blade  
18 pivot mount which is mounted near said right end of  
19 said blade support frame member, said aperture in said  
20 right mounting rib, and said aperture in said second  
21 blade pivot mount which is close adjacent said first  
22 blade pivot mount which is mounted near said right end  
23 of said blade support frame member, and wherein said  
24 other of said connecting members extends sequentially  
25 through said aperture in said first blade pivot mount  
26 which is mounted near said left end of said blade  
27 support frame member, said aperture in said left

28 mounting rib, and said aperture in said second blade  
29 pivot mount which is close adjacent said first blade  
30 pivot mount which is mounted near said left end of  
31 said blade support frame member.

1 8. A blade mounting structure as defined in Claim 1,  
2 wherein said connecting members each comprise:  
3 a pin; and  
4 a retaining member secured to said pin to retain  
5 said pin in place.

1 9. A blade mounting structure as defined in Claim 1,  
2 additionally comprising:  
3 retaining members for removably retaining said  
4 cushion stops in place.

1 10. A blade mounting structure as defined in Claim 9,  
2 wherein said cushion stops each have an aperture  
3 located therein, and wherein said one of said blade  
4 support member and said snow plow blade has a  
5 plurality of additional apertures located therein,  
6 said aperture in each of said cushion stops and one of  
7 said additional apertures being aligned when said  
8 cushion stops are mounted in position, and wherein  
9 said retaining members comprise:  
10 a bolt which extends through said aperture in  
11 each said cushion stop and one of said additional  
12 apertures to retain said cushion stop in said pocket;  
13 and  
14 a nut threaded onto said bolt to retain said bolt  
15 in position.

1 11. A blade mounting structure as defined in Claim 1,  
2 wherein said cushion stops are retained in position  
3 with an adhesive.

1 12. A blade mounting structure as defined in Claim 1,  
2 wherein said cushion stops are made of polyurethane.

1 13. A blade mounting structure as defined in Claim  
2 12, wherein said cushion stops are made of Quazi  
3 formulated methylenebisdiphenyl diisocyanate (MDI)  
4 polyester-based polyurethane.

1 14. A blade mounting structure as defined in Claim 1,  
2 wherein said cushion stops are made of a material  
3 having a hardness of approximately 93 durometer on the  
4 Shore A scale.

1 15. In a snow plow having a snow plow frame for  
2 detachable installation at the front of a vehicle, a  
3 shock-absorbing structure for cushioning the impact  
4 between a snow plow blade and a snow plow frame which  
5 supports the snow plow blade therefrom at a limit of  
6 movement of said snow plow blade, said shock-absorbing  
7 structure comprising:

8 a blade support frame member having right and  
9 left ends, said blade support frame member being  
10 supported by the snow plow frame which is detachably  
11 mounted at the front of the vehicle, said blade  
12 support member comprising:

13 a first blade pivot mount assembly which is  
14 mounted on said blade support frame member near  
15 said right end thereof, said first blade pivot  
16 mount assembly extending forwardly from said  
17 blade support frame member, said first blade  
18 pivot mount assembly having at least one aperture  
19 extending therethrough in the portion thereof  
20 which extends forwardly from said blade support  
21 frame member; and

22 a second blade pivot mount assembly which is  
23 mounted on said blade support frame member near  
24 said left end thereof, said second blade pivot

25           mount assembly extending forwardly from said  
26           blade support frame member, said second blade  
27           pivot mount assembly having at least one aperture  
28           extending therethrough in the portion thereof  
29           which extends forwardly from said blade support  
30           frame member;

31           a snow plow blade having a frame comprising a top  
32           plow frame member, a bottom plow frame member, and a  
33           plurality of vertically oriented curved ribs extending  
34           between said top and bottom plow frame members, said  
35           plurality of vertically oriented curved ribs including  
36           mounting ribs which each have an aperture extending  
37           therethrough, which apertures in said right and left  
38           mounting ribs define a pivot point for said snow plow  
39           blade;

40           a plurality of connecting members used to  
41           pivotally connect said mounting ribs to corresponding  
42           ones of said blade pivot mounts, said snow plow blade  
43           thereby being pivotable between a blade return  
44           position and a blade tripped position;

45           blade biasing members which urge said snow plow  
46           blade from said blade tripped position to said blade  
47           return position; and

48           a plurality of cushion stops mounted on one of  
49           said blade support frame member and said snow plow  
50           blade, said cushion stops being contacted by the other  
51           of said blade support frame member and said snow plow  
52           blade as they pivot prior to said snow plow blade  
53           reaching either said blade tripped position or said  
54           blade return position, said cushion stops being made  
55           of a hard, resilient, durable man-made material to  
56           absorb a substantial portion of the impact force which  
57           would otherwise be transferred to said blade support  
58           frame member.

1           16. A shock-absorbing structure for cushioning the  
2           impact between a snow plow blade and a snow plow frame

3 which may be installed at the front of a vehicle, said  
4 shock-absorbing structure comprising:

5 a blade support frame member with right and left  
6 ends which is supported from the snow plow frame which  
7 may be installed at the front of the vehicle, said  
8 blade support member having blade mounting members  
9 which are fixedly mounted adjacent said right and left  
10 ends of said blade support frame member;

11 mounting ribs contained in a frame of a snow plow  
12 blade which are pivotally mounted to corresponding  
13 ones of said blade mounting members, respectively,  
14 said snow plow blade thereby being pivotable between a  
15 blade return position and a blade tripped position;

16 blade biasing members which urge said snow plow  
17 blade from said blade tripped position to said blade  
18 return position; and

19 cushion stops mounted on one of said blade  
20 support frame member and said snow plow blade, said  
21 cushion stops being contacted by the other of said  
22 blade support frame member and said snow plow blade  
23 and absorbing a substantial portion of the impact  
24 force as said snow plow blade pivots prior to reaching  
25 at least one of said blade tripped position and said  
26 blade return position.

1 17. A method of cushioning the impact between a snow  
2 plow blade and a snow plow frame which may be  
3 installed at the front of a vehicle, said method  
4 comprising:

5 supporting a blade support frame member having  
6 right and left ends from the snow plow frame which is  
7 installed at the front of the vehicle;

8 fixedly mounting blade mounting members adjacent  
9 said right and left ends of said blade support frame  
10 member;

11 pivotally mounting mounting ribs contained in a  
12 frame of a snow plow blade to corresponding ones of

13       said mounting members, said snow plow blade thereby  
14       being pivotable between a blade return position and a  
15       blade tripped position;

16               biasing said snow plow blade from said blade  
17       tripped position to said blade return position; and

18               mounting a cushion stop on one of said blade  
19       support frame member and said snow plow blade, said  
20       cushion stops being contacted by the other of said  
21       blade support frame member and said snow plow blade  
22       and absorbing a substantial portion of the impact  
23       force as said snow plow blade pivots prior to reaching  
24       as least one of said blade tripped position and said  
25       blade return position.